

Appl. No : 10/655,690
Amdt. dated : 04/04/04
Reply to Office Action of 03/26/04

Amendments to the Specification:

1) page 10, second paragraph, please replace this paragraph with the following amended text:

In the process that has been described above, if the TiN barrier 22 is formed to an increasing thickness. ~~The, the~~ thermal budget ~~is high, therefore~~ increases. metal As a consequence, metal extrusions are more readily formed due to the ~~increasing temperature~~ higher temperatures that are experienced during the deposition of the layer of TiN of increased thickness. As the integration of semiconductor devices increases, the problem of the occurrence of metal extrusions ~~extrusion further~~ increases and ~~the problem~~ becomes ~~increasingly~~ more serious.

2) page 10, third paragraph, please replace this paragraph with the following amended text:

In addition and as imperfections in the deposition uniformity of the deposited layer 22 of TiN, pin-holes tend to form in the deposited layer 22 of TiN, potentially causing the

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layer 20 of Ti to be attacked by the WF_6 gas used during tungsten deposition, ~~causing~~ resulting in other via related issues.

3) page 10, fourth paragraph, page 11, first paragraph, please replace this paragraph with the following amended text:

The above phenomena ~~have been observed partially when~~ may result in an opening being created through the layer 22 of barrier material and the layer 20 of adhesion material[[,]]. This opening through layers 22 and 20 ~~exposing and further attacking exposes~~ the layer 14 of ARC, which may now be affected to the point where an opening is in turn created through the layer 14 of ARC, ~~which exposes~~ this latter opening exposing the layer 12 of (for instance) aluminum. The exposed layer 12 of aluminum is as a result affected, resulting in reduced contact performance of the point 12 of electrical contact.

4) page 11, second paragraph, please replace this paragraph with the following amended text:

The cumulative ~~latter effects~~ effect of chemical interactions of the above highlighted processing steps ~~that are~~

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~~required to create of tungsten interconnect overlying the~~
~~aluminum point 12 of electrical contact, which potentially~~
~~affect with the layers 22 of barrier material, 20 of adhesion~~
~~material and 14 of ARC, is shown in the cross section of Fig. 7.~~
These interactions proceed, as shown in the cross section of
Fig. 7, to the point where the underlying layer 12 of aluminum
is affected, that is the surface of the layer 12 of aluminum is
"gauged".

5) page 15, second paragraph, please replace this paragraph with
the following amended text:

The cross section shown in Fig. 12 shows that the
conductive interconnect, preferably comprising tungsten, can be
completed with the deposition of layer 32, preferably comprising
tungsten, over the layer 30 of TiN and by, Fig. 13, removing
excess tungsten from the surface of layer 30, using the layer 30
as stop layer.

6) page 16, last paragraph, please replace this paragraph with
the following amended text:

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Along the horizontal or X-axis ~~[[are]]~~ is shown a sequence of experimental wafers ~~that are used for the experiments~~, each wafer having ~~been provided with~~ an identification number such as wafer #0, wafer #25, wafer #50, etc.